



Solar Simulator

In the photo, a technician is examining a plant specimen to study its sunlight absorption. The "sunlight" is provided by a solar simulator, one of several produced by Oriel Corporation, Stamford, Connecticut. The simulators are laboratory tools for such purposes as testing and calibrating solar cells or other solar energy systems; testing dyes, paints and pigments, pharmaceuticals and cosmetic preparations; plant and animal studies, food and agriculture studies and oceanographic research.

Heart of the Oriel simulators is a high pressure xenon lamp whose reflected light is processed by an optical system to produce a uniform solar beam. Because of the many different applications, the simulators must be adjustable to replicate many different areas of the solar

radiation spectrum. For example, the systems can closely simulate solar radiation as it occurs in airless space, or simulate terrestrial solar radiation which is different because Earth's atmosphere absorbs and scatters the Sun's rays.

In developing simulators capable of reproducing close approximations of these and other solar spectral characteristics, Oriel Corporation drew upon NASA technology developed by Goddard Space Flight Center. Seeking solar radiation information important to establishing design criteria for space vehicles, Goddard scientists compiled extensive data—from ground-based, aircraft and sounding rocket tests—on the spectral distribution and total irradiance of the Sun. Oriel Corporation learned of this technology through NASA's New England Research Applications Center, made follow-up contact with Goddard scientists, and used the NASA measurements to model solar simulations.